UNITED STATES PATENT AND TRADEMARK OFFICE

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09/689,488	10/12/2000	Kevin Frank Smith	SJ00-00-044	7862

7590 03/30/2004	EXAMINER
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ART UNIT	PAPER NUMBER
2186	24

SALT LAKE CITY, UT 84101

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	**Applicant(s)**
	09/689,488	SMITH, KEVIN FRANK
Office Action Summary	**Examiner**	**Art Unit**	
	Zhuo H Li	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7,8,12-27 and 29-32* is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20* is/are allowed.

6)☒ Claim(s) *1-4,7,8,12-19,21-27 and 29-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Office action is in response to the amendment file on February 24, 2004 (Paper No.

23).

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1-3, 12, 19, 21-22 and 29-32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Datta (US PAT. 6,622,168).

Regarding claim 1, Datta discloses a method for scheduling pre-fetches into a cache, i.e.,

profiler (450, figure 4) of a data storage system, the method comprising remotely modeling

dynamic operation of the cache in a model, i.e., pre-loader (400, figure 4), the pre-loader

including a model, i.e., component cache (402, figure 4) of data elements currently stored within

the cache (col. 11 line 51 through col. 13 line 12 and col. 14 lines 39-50), assigning a priority

value to modeled data elements according to their history (col. 13 line 38 through col. 14 line 5),

making a cache management decision, i.e., cacheable and/or un-cacheable, based upon the model

(col.12 lines 47-62), executing pre-fetches into the cache in response to select cache management

decisions (col. 12 line 47 through col. 13 line 12). Although Datta does not clearly discloses the

method of network system having a step of assigning a priority value to a requested data element

based at least partially on whether a proceeding data element is present in the cache, Datta

teaches the pre-loader is able to pre-load the related information/data from the profile server to

the component cache based upon to the various requested data by sending the hint request to the

profile server, (col. 11 line 51 through col. 12 line 62 and col. 13 lines 23-37), i.e., the cache

management (406, figure 4) resides in the pre-loader (400, figure 4) generate a hint request to the

profile server based upon the requested and the information in the component cache (402, figure

4), such as perform a pre-load request, i.e., assign a priority value, when the requested

information is un-cacheable in the component cache, or the requested is further link to next

related information stored in the profile server. It would have been obvious to a person of

ordinary skill in the art at the time the invention was made to recognize the method of network

system in Datta having a step of assigning a priority value to a requested data element based at

least partially on whether a proceeding data element is present in the cache, because it improves

web page delivery speed and web site scalability by pre-fetching and caching dynamic web page

content.

Regarding claim 2, Datta discloses the method of making a cache management decision

comprises examining a request for a data element from a stream of Input/Output data requests

passed between a host, i.e., user (404 and 406, figure 4) and a storage device, i.e., profile server

(300, figure 4) of the data storage system, and determining whether to schedule a pre-fetch of a

data element logically successive to requested data element in accordance with contents of the

cache as indicated by the remote model (col. 11 line 51 through col. 13 line 37).

Regarding claim 3, Datta discloses the cache is a least recently used cache (col. 1 line 63

through col. 2 line 3 and col. 13 lines 38-61).

Regarding claim 12, Datta discloses the method wherein assigning a priority value further

comprise assigning a priority value comprising the priority value assigned to the preceding data

element plus one when the preceding data element is found to be present in the cache, i.e., the

cache management (406, figure 4) resides in the pre-loader (400, figure 4) generate a hint request

to the profile server based upon the requested and the information in the component cache (402,

figure 4), such as perform a pre-load request, i.e., assign a priority value, when the requested

information is un-cacheable in the component cache, or the requested is further link to next

related information stored in the profile server (col. 11 line 51 through col. 12 line 62 and col. 13

lines 23-37).

Regarding claim 19, Datta discloses the method wherein making a cache management

decision comprises deciding to schedule a pre-fetch, and further comprising scheduling a pre-

fetch by sending an Input/Output request, i.e., hint request to the cache, i.e., profile server, (col.

11 line 51 through col. 12 line 62 and col. 13 lines 23-37).

Regarding claim 21, Datta discloses a data pre-fetch scheduling system comprising a

cache, i.e., profiler configure to communicate with a host, i.e., user (404 or 406 figure 4), and a

remote pre-fetch module, i.e., pre-loader (400, figure 4) configured to communicate with the host

and the cache by transferring the requested information from the profile server to the user, and

further configured to determine whether to schedule a pre-fetch of data into the cache, wherein

the determination to pre-fetch data is at least partially determined based on whether a data

element preceding a requested data element is present in the cache (col. 9 line 35 through col. 10

line 2), a modeling module operation within the remote pre-fetch module configured to model

the cache, including providing a model, i.e., component cache (402, figure 4) of data elements

currently stored within the cache (col. 11 line 51 through col. 13 line 12 and col. 14 lines 39-50),

a pre-fetch request module configured to request a data I/O, i.e., hint request, from the cache

when the remote pre-fetch module determines that a pre-fetch is to be conducted (col. 12 line 47

through col. 13 line 12). Although Datta does not clearly discloses each data element is assigned

a priority value according to its history. Datta teaches the pre-loader is able to pre-load the

related information/data from the profile server to the component cache based upon to the

various requested data by sending the hint request to the profile server, (col. 11 line 51 through

col. 12 line 62 and col. 13 lines 23-37), i.e., the cache management (406, figure 4) resides in the

pre-loader (400, figure 4) generate a hint request to the profile server based upon the requested

and the information in the component cache (402, figure 4), such as perform a pre-load request,

i.e., assign a priority value, when the requested information is un-cacheable in the component

cache, or the requested is further link to next related information stored in the profile server. It

would have been obvious to a person of ordinary skill in the art at the time the invention was

made to recognize the method of network system in Datta having a step of assigning a priority

value to a requested data element based at least partially on whether a proceeding data element is

present in the cache, because it improves web page delivery speed and web site scalability by

pre-fetching and caching dynamic web page content.

Regarding claim 22, the limitations of the claim are rejected as the same reasons set forth

in claim 3.

Regarding claim 29, Datta discloses a remote pre-fetch module, i.e., pre-loader (400,

figure 4) for determining whether to schedule a pre-fetch of data into a cache, i.e., profiler, of a

computer system, i.e., network computer system, the pre-fetch module comprising a modeling

module, i.e., pre-loader, configured to module dynamic operation of the cache, wherein the

modeling module is further configure to provide a model, i.e., component (402, figure 4) of data

elements currently stored within the cache (col. 11 line 51 through col. 13 line 12 and col. 14

lines 39-50), a calculation module, i.e., cache manager (406, figure 4) configured to make a

cache management decision, i.e., cacheable and/or un-cacheable, and/or more related hint

information in profile server based upon the model, wherein the cache management decision is at

least partially determined based on whether a data element preceding a requested data element is

present in the cache (col. 12 line 47 through col. 13 line 12). Although Datta does not clearly

discloses each data element is assigned a priority value according to its history and requested

data elements are assigned a priority value based at least partially on whether a preceding data

element is present in the cache. Datta teaches the pre-loader is able to pre-load the related

information/data from the profile server to the component cache based upon to the various

requested data by sending the hint request to the profile server, (col. 11 line 51 through col. 12

line 62 and col. 13 lines 23-37), i.e., the cache management (406, figure 4) resides in the pre-

loader (400, figure 4) generate a hint request to the profile server based upon the requested and

the information in the component cache (402, figure 4), such as perform a pre-load request, i.e.,

assign a priority value, when the requested information is un-cacheable in the component cache,

or the requested is further link to next related information stored in the profile server. It would

have been obvious to a person of ordinary skill in the art at the time the invention was made to

recognize the method of network system in Datta having a step of assigning a priority value to a requested data element based at least partially on whether a proceeding data element is present in the cache, because it improves web page delivery speed and web site scalability by pre-fetching and caching dynamic web page content.

Regarding claim 30, the limitations of the claim are rejected as the same reasons set forth in claim 29.

Regarding claim 31, the limitations of the claim are rejected as the same reasons set forth in claim 1.

Regarding claim 32, the limitations of the claim are rejected as the same reasons set forth in claim 21.

4.   Claims 4 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Datta (US PAT. 6,622,168) in view of Tipley et al. (US Pat. 5,325,504 hereinafter Tipley).

Regarding claim 4, Datta differs from the claimed invention in not specifically teaches the LRU cache is a native LRU-only cache, and further comprising step of leaving the native LRU-only cache substantially unmodified. However, it is notoriously well know in the art of using least recently used cache native LRU-only cache in order to properly reshuffle a replacement order based on requested hits to a particular way, for example see Tipley (col. 2 lines 34-47 and col. 7 lines 51-65). By using least recently used cache or native LRU-only cache as taught by Tipley, it increases system efficiency of Datta by overwriting or recycling an oldest least recently used information/data in sequence. Therefore, it would have been obvious to a

person of ordinary skill in the art at the time the invention was made to modify Datta in using

least recently used cache or native LRU-only cache because of increasing system efficiency.

Regarding claims 23-24, the limitations of the claim are rejected as the same reasons set

forth in claim 4.

5.   Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Datta (US PAT.

6,622,168) in view of Kurokawa et al. (UP 04-367984).

Regarding claim 7, Datta differs from the claimed invention in not specifically teaches

the method wherein remotely modeling the cache further comprises determining a size of the

cache, periodically fetching an Input/Output rate of the cache, and periodically fetching a hit rate

of the cache. However, Kurokawa teaches a cache control unit for periodically fetching and I/O

rate of the cache and a hit rate of the cache in order to facilitate the development of a program

whose cache hit ratio is high. By periodically fetching the I/O rate and the hit rate of the cache

as taught by Kurokawa, it increases the cache-hit-ratio. Therefore, it would have been obvious to

a person of ordinary skill in the art at the time the invention was made to modify Datta in

periodically fetching and I/O rate of the cache and periodically fetching a hit rate of the cache, as

per teaching of Kurokawa, because it increases the cache hit-ratio.

6.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Datta (US PAT.

6,622,168) in view of McNutt et al. (US PAT. 5,606,688 hereinafter McNutt).

Regarding claim 8, Datta differs from the claimed invention in not specifically teaches

the method wherein remotely modeling the cache further comprises periodically calculating a

single residency time (SRRT) for a data element within the cache. However, it is notoriously

well know in the art of periodically calculating a single reference residency time (SRRT) for a

data element within the cache, for example see McNutt (abstract, col. 10 lines 52-65 and col. 11

lines 41-45). Therefore, it would have been obvious to a person of ordinary skill in the art at the

time the invention was made to modify the network system of Datta periodically calculating a

single reference residency time (SRRT) for a data element within the cache, as per teaching of

McNutt, because it optimizes the efficiency with the cache controller for maintaining useful data

in the cache.

7.   Claims 13-14 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Datta (US PAT. 6,622,168) in view of Dixion et al. (US PAT. 4,490,782 hereinafter Dixion).

        Regarding claims 13-14, Datta differs from the claimed invention in not specifically

teaches the method wherein determining whether to schedule a pre-fetch of a element further

comprises comparing the priority value of the requested element with a dynamic threshold and

the pre-fetching the requested data element into the cache if the priority value of the requested

data element is greater than the dynamic threshold. However, Dixion teaches cache system with

pre-fetch determined by requested record's position within data block comprising the steps of

assigning a priority position to a requested data element in order to determine whether to

schedule a pre-fetch of a data element by comparing the priority value of the requested with

dynamic threshold and pre-fetching the requested data element when the priority value is greater

than the dynamic threshold (col. 15 line 46 through col. 18 line 59). Therefore, it would have

been obvious to a person of ordinary skill in the art at the time the invention was made to modify

the network system of Datta in having method step of determining whether to schedule a pre-

fetch of a element further comprises comparing the priority value of the requested element with a

dynamic threshold and the pre-fetching the requested data element into the cache if the priority

value of the requested data element is greater than the dynamic threshold, as per teaching of

Dixiion, because it provides a data processor with substantially increased operating speed.

Regarding claims 25-27, the limitations of the claims are rejected as the same reasons set

forth in claims 13-14.

8.   Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Datta (US

PAT. 6,622,168) in view of Weinberger et al. (US PAT. 6,453,389 hereinafter Weinberger).

Regarding claims 15-18, Datta differs from the claimed invention in not specifically

teaches periodically re-evaluating the performance of the cache model comprising the steps of

determining whether the dynamic threshold used in the internal model of the cache accurately

models the performance of the cache by comparing the performance of the dynamic threshold

with an alternate dynamic threshold. However, Weinberger teaches the computer system

comprising a pre-fetch apparatus (300, figure 4) recursively reevaluate the performance of the

cache by the same determination and compare steps (col. 7 lines 16-60 and col. 16 lines 6-52).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the

invention was made to modify the network system of Datta in the pre-fetch method of

periodically re-evaluating the performance of the cache model comprising the steps of

determining whether the dynamic threshold used in the internal model of the cache accurately

models the performance of the cache by comparing the performance of the dynamic threshold

with an alternate dynamic threshold, as per teaching by the computer system of Weinberger, because it minimize the data missed of the memory accessing operation and prevent the computer system stalls.

Allowable Subject Matter

9.   Claim 20 is allowed.

Response to Arguments

10.   Applicant's arguments with respect to claims 1-4, 7-8, 12-19, 21-27 and 29-32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zhuo H Li whose telephone number is 703-305-3846. The examiner can normally be reached on Tue-Fri 9:00 a.m. to 6:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 703-305-3821. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zhuo H. Li

March 19, 2004

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